

REMARKS

Applicant has carefully reviewed and considered the Office Action mailed on December 9, 2002, and the references cited therewith.

Claims 1, 3-4, 6, 9, 12, 14, 17-18, 25 and 27-28 are amended, claims 2, 11 and 26 are canceled; claims 34-38 are added; as a result, claims 1, 3-10, 12-25 and 27-38 are now pending in this application.

The claims have been amended for clarification, and such amendments are not intended to limit the scope of equivalents to which any claim element may be entitled. The amendments to the claims have support throughout the specification. No new matter has been added as a result. Applicants respectfully request reconsideration of the above application in view of the amendments and the remarks that follow.

Claims 2, 11 and 26 have been canceled solely to advance the prosecution of the present application, and without prejudice to their further prosecution in an appropriately filed continuing or divisional application.

§112 Rejection of the Claims

Claims 9, 11, and 17 were rejected under 35 USC § 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 11 has been canceled, thus rendering this rejection moot as it applies to claim 11.

The Examiner states that a torque driver is not shown or explained in the specification. Applicant has amended claim 9 for clarification.

The Examiner states that the phrase relating to "permanent" mounting or attaching of the heat sink are in narrative form and have not been given patentable weight. The Examiner further states that the claims relate to a threaded connection or a mounting plate attached to a circuit board by a plurality of locking pins having slidable bosses.

Applicant first notes that claim 17 does not recite a threaded connection. (A thermal solution having a threaded base engageable with threads in the mounting plate opening.

is recited in claim 7). Additionally, claim 17 does not recite a mounting plate attached to a circuit board by a plurality of locking pins having slidable bosses. (Slidable bosses are recited in claim 6).

Claim 17 has been amended to depend from claim 1 and to recite an apparatus used to permanently attach the thermal solution (as compared with temporarily attaching the thermal solution as recited in claim 14).

Reconsideration and withdrawal of this rejection is respectfully requested.

§102 Rejection of the Claims

Claim 1 was rejected under 35 USC § 102(b) as being anticipated by McCullough et al. (U.S. Patent No. 6,014,315).

The Examiner states that McCullough discloses an apparatus for attaching a thermal solution to a circuit board.

McCullough discusses a heat dissipating device that can provide multiple levels of pressure to a semiconductor package, having an outer peripheral ceramic region and an inner silicon region.

In contrast, claim 1, as amended, recites an apparatus for attaching a thermal solution to a circuit board comprising a mounting plate having a mounting plate opening designed to allow the thermal solution to contact a processor, the processor located on the circuit board; a backing plate connectable to the mounting plate, the backing plate designed to prevent flexure of the circuit board; and a connector having a first end and a second end, the first end attachable to the mounting plate and the second end securable to the circuit board and to the backing plate, the connector designed to keep the mounting plate in contact with the processor.

McCullough does not teach each element of claim 1 because it does not teach a backing plate connectable to the mounting plate.

McCullough does not anticipate the claims, as amended. Applicant respectfully submits that the claim 1 is allowable in its present form and notification to that effect is respectfully requested.

§103 Rejection of the Claims

Claims 2-33 (9, 11, and 17 as best understood by the Examiner) were rejected under 35 USC § 103(a) as being unpatentable over McCullough et al. (U.S. Patent No. 6,014,315) in view of Kehley et al. (U.S. Patent No. 5,919,050). The Applicant respectfully traverses this rejection. Additionally, claims 2, 11 and 26 have been cancelled, thus rendering this rejection moot as it applies to these claims.

The Examiner states that McCullough teaches all the limitations of the claims except a backing plate and certain design of key hole slots, etc. The Examiner further states that Kehley teaches an apparatus for attaching a passive thermal solution to a circuit board and to a package either permanently or temporarily and that both Kehley and McCullough represent a similar type of "non-destructive" socketed mounts of processors and heat sinks. The Examiner continues by stating that McCullough is designed to provide a heat sink assembly with multiple (predetermined) pressure capabilit[ies] and that Kehley is provided with a backing plate and locking pins. The Examiner concludes that it would have been obvious to employ a backing plate and plurality of locking pins in the device of McCullough as shown by Kehley to prevent flexure of the board and to facilitate mounting and dismounting of the heat sink during testing. The Examiner further states that the method steps in claim 25-33 are obviously necessitated by the device structure as shown by McCullough and Kehley.

Applicant respectfully submits that the Examiner has not established *prima facie* obviousness of the present claims. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the cited references themselves or in the knowledge generally available to an art worker, to modify the reference or to combine reference teachings so as to arrive at the claimed invention. Second, the art must provide a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. In re Ochiai, 37 USPQ2d 1127 (Fed. Cir. 1997) (When evaluating the scope of a claim, every limitation in the claim must be considered).

Applicant further notes that claims 3-10, 12-18, 20-24, 27-28 and 30-33 are dependent claims. The additional limitations provided in dependent claims cannot by themselves be rendered obvious over the cited references if the independent claim from which it depends is

determined to be nonobvious. As claims 3-10, 12-18, 20-24, 27-28 and 30-33 depend from and further define claims 1, 19, 25 and 29, respectively, these claims are believed to be allowable.

McCullough does not teach or suggest the claimed invention. McCullough discusses a heat dissipating device that does not teach or suggest a backing plate.

In contrast, claim 1, as amended, from which claims 3-10 and 12-18 depend, recites a backing plate. Similarly, claim 19 recites a backing plate, claim 25, as amended, recites providing a backing plate, and claim 29 recites providing first and second plates.

Kehley does not overcome the deficiencies of the primary reference. Kehley discusses a socket that connects electronic components, such as integrated circuit modules with arrays of solder balls or columns, lands, pads of similar contact to other components, typically substrates such as printed circuit boards. Kehley does not teach a mounting plate having a mounting plate opening designed to allow the thermal solution to contact a processor or a thermal solution secured to an opening in the plate.

The product in the primary reference and the product in the secondary reference are fundamentally different from each other and such critical differences must be recognized. In re Bond, 910 F.2d 831, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990), *reh'g denied*, 1990 U.S. App. LEXIS 19971 (Fed. Cir.1990).

Furthermore, there is no suggestion in McCullough *as to the desirability* of having a backing plate nor is there any indication of any appreciation of the problem being solved by Applicant's invention. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. Uniroyal Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir.1988). Applicant requests the Examiner to either provide evidence of such motivation or withdraw this rejection. See also In re Sang Su Lee, No. 00-1158 (Serial No. 07/631,240), (Fed. Cir.), decided January 18, 2002.

In any case, the suggested combination does not teach each and every element of Applicant's claims. Applicant is the first to provide an apparatus for attaching a thermal solution to a circuit board having a mounting plate with a mounting plate opening designed to allow the thermal solution to contact a processor and-a backing plate connectable to the mounting plate, as recited in claim 1, as amended, the claim from which claims 3-10 and 12-18 depend. Applicant is

also the first to provide a removable thermal solution attachment mechanism comprising a mounting plate having a mounting plate opening designed to allow the thermal solution to contact a processor located in a package; a backing plate designed to connect to the mounting plate; and connectors insertable into the mounting plate and backing plate wherein the thermal solution can impart a force on the package when the thermal solution is secured to the mounting plate, further wherein the thermal solution can remove heat from the processor, as recited in claim 19. Applicant is also the first to provide a method for attaching a thermal solution to a circuit board comprising placing a mounting plate on top of a processor, the processor located on a top surface of the circuit board and the mounting plate having a mounting plate opening designed to allow the thermal solution to contact a processor; aligning slots on the mounting plate with locking pins securable to the circuit board; providing a backing plate designed to give support to the circuit board, the locking pins also securable to the backing plate; inserting one end of each locking pin into each mounting plate slot; sliding each locking pin along a shelf located in each mounting plate slot; and securing a thermal solution to the mounting plate wherein pressure is applied to a package secured to the processor, the package located beneath the thermal solution, as recited in claim 25, as amended. Applicant is also the first to provide a method for temporarily attaching a thermal solution to a circuit board comprising providing a thermal solution attachment mechanism having first and second plates and a set of connectors to connect the first and second plates together; placing a circuit board between the first and second plates wherein a thermal solution secured to an opening in the first plate contacts a package located on the circuit board; testing the circuit board, wherein heat is removed by the thermal solution from a processor located in the package; and removing the thermal solution attachment mechanism from the circuit board, as recited in claim 29.

The references neither independently, or combined, contain each and every element of Applicant's claimed invention. Applicant respectfully submits that claims 3-10 and 12-18, as well as claim 19 (and claims 20-24 which depend from claim 19), claim 25 (and claims 27-28 which depend from claim 25), claim 29 (and claims 30-33 which depend from claim 29), are patentably distinct from the cited references, either alone or in combination. The claims, as amended, each viewed as a whole, are not suggested by the cited references and not obvious

under 35 U.S.C. 103. Reconsideration and withdrawal of this rejection is respectfully requested as it may apply to any of the pending claims.

The Examiner provides additional statements with respect to dependent claims 10, 13, and 15-16 stating that such claims recite variables that might be characterized as routine experimentation and requests a showing of unexpected results. The Examiner further states, regarding claim 18, that Kehley and McCullough teach the limitations of the claim except for the material used and that such materials are an obvious design choice.

The Applicant again respectfully traverses the Examiner's conclusions and requests that the Examiner provide a reference in support of these assertions or withdraw this rejection (See MPEP 2144.03). Even if such range of sizes and materials were well known, that still does not teach or suggest every element of the claim.

Applicant again respectfully submits that the Examiner has not established the *prima facie* obviousness of the present claims.

Again, the additional limitations provided in dependent claims cannot by themselves be rendered obvious over the cited references if the independent claim from which the claim depends is determined to be nonobvious.

Applicant respectfully submits that claims 10, 13 and 15-16 are patentably distinct from McCullough in view of Kehley, either alone or in combination. Claims 10, 13 and 15-16, each viewed as a whole, are not suggested by the cited references and not obvious under 35 U.S.C. 103. Reconsideration and withdrawal of this rejection is respectfully requested.

Claim 18

Claim 18 was rejected under 35 USC § 103(a) as being unpatentable over McCullough et al. (U.S. Patent No. 6,014,315) and Kehley et al. (U.S. Patent No. 5,919,050) in view of Loo (EP 0637 079 A1) or Mira (U.S. Patent No. 5,662,163). The Applicant respectfully traverses this rejection.

The Examiner states that both Loo and Mira teach an electronic package comprising a heat sink on one side of a circuit board and a backing plate on the other side and connectors, with

the backing plate and connectors made from steel. The Examiner concludes that it would have been obvious to make these parts from steel in the device by McCullough and Kehley as shown by Loo or Mira in order to use a material appropriate for stamping.

Applicant again respectfully submits that the Examiner has not established the *prima facie* obviousness of the present claims.

Again, claim 18 is dependent on claim 1. The additional limitations provided in a dependent claim cannot by themselves be rendered obvious over the cited references if the independent claim from which it depends is determined to be nonobvious.

As discussed above, neither Kehley nor McCullough teach or suggest the claimed invention.

Neither Loo nor Mira overcome the deficiencies of the primary references. Loo discusses a substrate, an alignment plate, a heat sink, a back plate with extrusions having threaded ends, a plurality of spacers with flanged openings at both ends, and a plurality of nuts to removably package a number of semiconductor packages into a single module. Mira discusses a removable heat sink assembly apparatus having a backing plate with alignment pins.

Claim 18 recites, in part, a mounting plate having a mounting plate opening designed to allow the thermal solution to contact a processor, a backing plate connectable to the mounting plate and a connector, wherein the mounting plate, backing plate and connector are each made from a material selected from the group consisting of aluminum, steel and plastic.

Again, there is no suggestion *as to the desirability* in McCullough or Kehley of utilizing the materials of Loo or Mira, nor is there any indication of any appreciation of the problem being solved by Applicant's invention. The prior art must provide a motivation or reason for the worker in the art, without the benefit of the Applicant's specification, to make the necessary changes in the reference device. Ex parte Chicago Rawhide Manufacturing Co., 226 USPQ 438 (PTO Bd. App. 1984). Focus should not be solely on the product created, but rather, on the obviousness or non-obviousness of its creation. The initial inquiry should be directed to the vantage point of attacking the problem solved by the invention at the time the invention was made. When prior art itself does not suggest or render obvious the claimed solution to that problem, the art involved does not satisfy the criteria of 35 USC 103 for precluding patentability.

Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co., 730 F.2d 1452, 221 USPQ 481 (Fed. Cir. 1984). Hindsight reconstruction of prior art is not the applicable standard for the determination of obviousness. Maschinenfabrik Rieter A.G. v. Greenwood Mills, 340 F.Supp. 1103, 173 USPQ 605, 610 611 (SC 1972). Applicant requests the Examiner to either

- provide evidence of such motivation or withdraw this rejection.

The references neither independently, or combined, contain each and every element of Applicant's claimed invention. Applicant respectfully submits that claim 18 is patentably distinct from McCullough and Kehley in view of Loo or Mira, either alone or in combination. Claim 18, viewed as a whole, is not suggested by the cited references and not obvious under 35 U.S.C. 103. Reconsideration and withdrawal of this rejection is respectfully requested.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney Barbara Clark at 515/233-3865 or the below signed attorney to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231, on this 10th day of March 2003.

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